

**COMMUNITY MOSAIC: FINDING WAYS TO EAT MORE  
HEALTHFULLY IN A LOW-INCOME AFRICAN AMERICAN  
COMMUNITY**

A Thesis  
Presented to  
The Academic Faculty

by

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In Partial Fulfillment  
of the Requirements for the Degree  
B.S. Computational Media with Research Option in the  
College of Computing

Georgia Institute of Technology  
May 2010

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## **ACKNOWLEDGEMENTS**

I would like to thank my mother and father, who have supported me throughout my endeavors. I would like to thank my participants, the YMCA, the members of the Human Computer Interaction Community in Georgia Tech. In addition I would like to thank my reviewers at Georgia Tech. Most Importantly, I would like to thank Andrea Grimes and Beki Grinter for mentoring me on the research presented in this thesis.

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## **ABSTRACT**

Community Mosaic is a system to promote healthy eating amongst low-income African American people. This thesis analyzes a study I conducted that encourages people to talk about what they think are the barriers against as well as the resources for trying to eat healthfully. The results of this study will be useful for the low-income African American community as well as the HCI (Human Computer Interaction) community. More specifically, the results will facilitate towards finding ways to eat more healthily due to the correct understanding of the barriers against and available resources for eating healthfully in a community. The African American community is known to have more diet-related health problems than other ethnic communities in the US; by understanding the reasons behind these problems, the goal is to help minimize them.



# **CHAPTER 1**

## **INTRODUCTION**

Low-income African American communities have many health disparities when compared to the overall American population. The dietary habits of many people in these groups – such as high calorie and fat diets along with low intake of fruits and vegetables – contribute towards the cause of prevalent chronic diseases [1]. In this thesis, I analyze what people in the low-income African American community in south west Atlanta consider as barriers against and resources for eating healthfully. This will in turn help their community as well as the HCI community to understand why low-income African Americans are having this problem and what can be done to prevent it. In order to analyze all of the above, The Community Mosaic public display will serve as an interactive medium for people to see how people are trying to eat nutritiously. By using CM (Community Mosaic) people will share how they are trying to eat healthier on a daily basis by taking pictures and sending it to the CM, which will hopefully in turn inspire others to try that particular eating strategy.

The 2-part technology system of CM, consisting of a cell phone application and an interactive public display, provides various functionalities for people. First, it allows people to more easily share their experiences of trying to eat healthfully with others because of the MMS processing capability that sends the messages to the display system and the visualization that is displayed on the GUI of a public display. Second, it lets them react to the experiences of others, providing a sense of how the community feels about these different healthy eating strategies (i.e. through the feedback mechanisms). Lastly, it

encourages others to "take" others' experiences with them i.e. because people can text CM to request a piece of the mosaic be sent to them on their phones. CM has been built by my mentor Andrea Grimes and I analyzed data of the focus groups conducted in the YMCA to give design implications for CM and see if people's perception of eating healthfully matches with the goals of CM.

In order to analyze this system I used the following evaluation methods: Focus groups, Surveys, Computed Descriptive Statistics and Open Coding Analysis of the Focus Groups. In the focus groups conducted in the YMCA, I did a design activity that helped people express what they thought were the most important and least important things while trying to eat healthfully in their community. I compared the choices people expressed in the focus groups and extracted the reasons why people made those choices to look for trends for the design of the CM technology. In order to do this I analyzed focus groups' transcripts using the grounded theory approach and survey results using computed descriptive statistics.

I conducted this study to answer the following questions:

1. What are people's perceptions about trying to eat healthfully within their African American community?
2. What are the different kinds of reactions people have for using a technology that promotes health on the community level?

The results of my research will be helpful for refining the design of CM, because the design can be tailored to meet the recommendations of different kinds of people, for example married and single mothers. In addition, after the CM is built, it will also help us

examine whether or not CM is helping people eat healthfully by comparing eating habits prior to the use of CM with the eating habits after the use of CM.

The next few sections discuss previous research that conceptualizes my own work. I then explain the Community Mosaic system in greater detail with respect to its design and functions. Next, I explain the method of the user study along with its results. Finally, I discuss my overall findings of the idea of using the CM as well as its impact on the low-income African American community as a whole towards eating healthfully.

## **CHAPTER TWO**

### **RELATED WORK**

In this section I will talk about previous studies done on health in the African American community with respect to other ethnic groups in the US. I will then examine people's perceptions of how easy or difficult it is to eat healthfully in their community and the barriers as well as the resources to doing so. Finally, I will compare different studies of technologies for health in a social context, all of which are studies from HCI-related fields.

#### **Health in African American Community**

It has been noted by various researchers that the African American community has more health disparities as compared to the general American population. For example, they have a higher prevalence of obesity and weight related diseases [1, 2]. Therefore, it is important to figure out why such health disparities occur and what would be the best way to encourage healthy eating. My research will provide insight into determining who is most affected in this population and why. For example, James [1] identifies that the women of this community should be targeted for education programs, as they are primarily responsible for food shopping and preparation. An interesting finding from this study was that women with children were least concerned about their weight. Given this finding, it will be interesting to find similar trends by analyzing the food habits of different people categories like single mothers, married mothers, married females without children etc.

## **People's Perceptions of Health in their Community**

The kind of opinions expressed by the selected group of African Americans in north central Florida from James' study were very similar to the group in south west Atlanta from my study. For example, both groups of women expressed dislike towards doctors giving diet sheets to them with pictures of women who looked nothing like them. Both the groups felt that such a health resource was not culturally relevant and specific to them. This helps us develop a better picture of the perceptions of the African American community on health-related topics.

Angel and Worobey [6] confirm that single mothers report poorer overall physical health for their children than do mothers in intact marriages. The study analyzes the effect of marital status on a mother's perceptions of her child's health. This helped towards understanding the characteristics of single mothers for comparing the perceptions of single mothers to other demographic groups about health related issues. Even though this study talks about single mother problems like less overall family income and emotional strain due to lack of confidence, it does not talk about female characteristics and focuses more on child health problems. In this thesis, I examine female characteristics such as marital status and number of children to have a better understanding of how personal background affects people's perceptions.

## **Social Technologies for Health**

In a study, a participant expressed distrust of food technology by saying that, *"Fake fat and fake sugar, how are those healthy? They do so much to the food with all that technology that it can't be good for you [1]."* The author did not look into why people thought that technology is not good for food. It would help if more research is

done to understand the negative attitude of the people towards technology. My research focus will include exploration of people's opinions of using a technology while the overall Community Mosaic project will use technology as a motivating factor to promote healthy eating amongst the African American community.

Eat well is a system that allows community members to share how they are trying to eat healthfully through audio recordings. From the study, it was found that by allowing users to create audio memories, it provided a way for users to enjoy how their audio memories was making a change in diet and seeing the positive impact of that change [2].

EatWell also talks about the community empowerment concept [10], which is relevant for our study as well. In the study, one of the participants mentioned how it was nice to know that people sharing these voice memories of health were all in the same community and that in most cases there was a common situation of trying to deal with some of the same issues. Just like EatWell, Community Mosaic also supports the cultural construct of collectivism, that is, individuals placing a strong emphasis on community issues and needs.

CM uses pictures and texts to display participant's healthy eating strategies whereas EatWell uses voice. Moreover, the content sent to CM is publicly visible and encourages interaction via a public display, which EatWell does not support as it is limited to cell phones. CM also incorporates feedback mechanisms for the users on their shared information. Therefore, we see how CM represents an alternate approach to sharing of healthy eating strategies than taken in EatWell. . By studying the focus-group data, I will gain a more in-depth understanding of the benefits of different approaches to help people learn about nutrition from the experiences of members of their community.

One of the biggest challenges faced by the participants of EatWell was deciding how to create memories that would be useful to and well received by others. We plan to address the challenge described in EatWell in the design of CM. For example, we plan on sending reminders to the users to use our system by sending texts informing them about how many people have shared as well as committed to different strategies.

Fox and Jones talk about the American Pursuit of Health through online and offline resources in their study. Even though 61% of the American adult population looks online for health population, they still look at traditional methods for getting help in case of medical emergencies with 86% going to doctors for advice and 68% going to friends/family for help [3]. Therefore, the Community Mosaic can help bridge the gap between technology (being online for help) and looking to family/friends for help. Community Mosaic is helping to present the advice of family and friends through an interactive public display, which helps in communication in this ever-busy world. In addition, this community level sharing also shows that the information/help people try to get is from legitimate sources that they can trust.

While there are currently only pockets of people participating in the online conversation, there is evidence that “when patients managing the same chronic condition share observations with each other, their collective wisdom can yield clinical insights well beyond the understanding of any single patient or physician.”[3] Indeed, allowing patients “to transport the full value of these communities back offline” may hold promise for the integration of new and traditional health care services [3]. This paragraph reflects on the importance of collective information in a community to promote healthy eating, which is better than just individual thoughts. “The integration of new and traditional

methods of health care services” [3] is what will make the CM project worthwhile to use in the African American community.

Further study is needed to determine the reasons why African American and Latino information seekers were more likely than whites to say that online health resources “*had a beneficial impact on their knowledge about treating an illness or condition*”[5], but one factor cited by the paper’s authors is that African American and Latino consumers are less likely than whites to have a usual doctor or other care provider and therefore “may find information obtained from other sources has more impact on their health knowledge or behaviors.”[4] The Pew Hispanic Center and Robert Wood Johnson Foundation have also recorded lower levels of access to usual health care providers among Latinos in the U.S. This suggests that CM may be useful, cheap and easily accessible for the low income African American people.



## **CHAPTER THREE**

### **COMMUNITY MOSAIC**

My study focuses on finding out focus group participant's opinions about healthy eating in their community. The results of my study will show how Community Mosaic, developed by my mentor Andrea Grimes, can be a useful system for the participants to share healthful eating strategies within their community. Community Mosaic consists of an interactive public display and a phone interface. People will use cell phones to record how they are eating healthfully and share with the display, where people can view the ideas of others and react to those ideas. By having these two points of access and creating information, the goal is the two-fold. First, the interactive display will make more publicly visible the community-held knowledge and sentiments, and provide a forum for interacting with the content in interesting ways. Second, the mobile application will allow people to share content as they go through their daily lives and to capture (via photography and texts) the things in their daily lives that help them to eat more healthfully. It will be important to note that people will use their existing cell phones to send content while our CM server software will do the processing of sent content, visualization, etc. Finally, CM will have functionality that will encourage people to “commit” to trying out strategies shared in the system, or adaptations of those strategies.

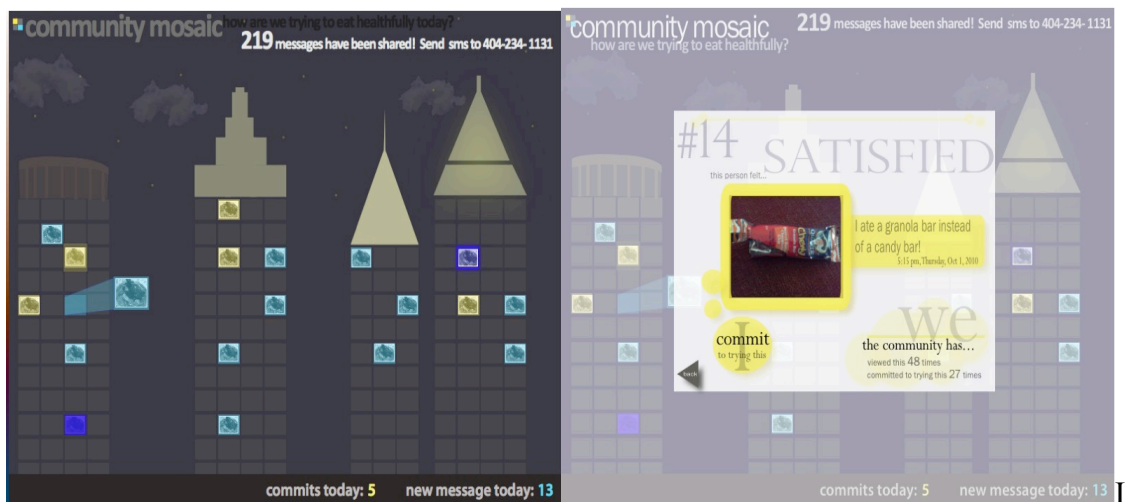
#### **How the content creation works**

1. Take a picture of how you are trying to eat healthfully today or/and attach a short text caption to describe the image.

2. Associate an emotion tag to express how you feel (Due to feedback from the focus groups conducted with the HCI community at Georgia Tech, we will no longer be keeping the feature of expressing an emotion tag.)
3. Send it to the Community Mosaic number.

For example, Sally takes a picture of a yoghurt because she thinks its a healthy choice for breakfast and sends it to the CM number.

## Design Significance



**Figure 1. (Left) The Main CM display screen**

**Figure 2. (Right) Enlarged image of a selected picture**

**Figure 1:** The main screen shows the Atlanta skyline, which we hope will encourage people in this community to feel a sense of belonging while using this system. Every building has windows with blue light representing messages sent today and yellow light representing the strategies that people committed to that day. Every window has pictures of content sent by the community members that signify the metaphor of a source of light,

which is touched by a user to share light about the strategies for eating healthfully. The main prompt on the screen for the onlookers is by asking them how they are trying to eat healthfully today.

**Figure 2:** Once the user taps on window image, it zooms in to show a bigger version of the picture, the text explaining the strategy used, an “I Commit” button for those who actually plan on trying on that particular strategy, and a bubble that shows how many people have viewed as well as committed to that eating strategy.

### **Description of the back-end**

We are using a MySQL database to store MMS content (images, caption, etc.) and other relevant system information. We are using a Google Android phone that runs our Java code. This code acts as an MMS/SMS gateway. As such, the code processes incoming MMS & SMS messages & uses HTTP POST to send MMS data (images, caption etc.) to php scripts on our CM server (code that resides on College of Computing web server). Once data is sent to CM server, it is received by PHP scripts, which store the content on the server (that is, the image files) and in the database (i.e. caption, ID of sender, date & time etc.)

The front end UI is developed in Flex. The UI will be accessible via a Samsung 40 inch touch screen display, which will use the YMCA wireless network to display the CM UI (which resides on the CM server at GT).

## **CHAPTER FOUR**

### **METHOD**

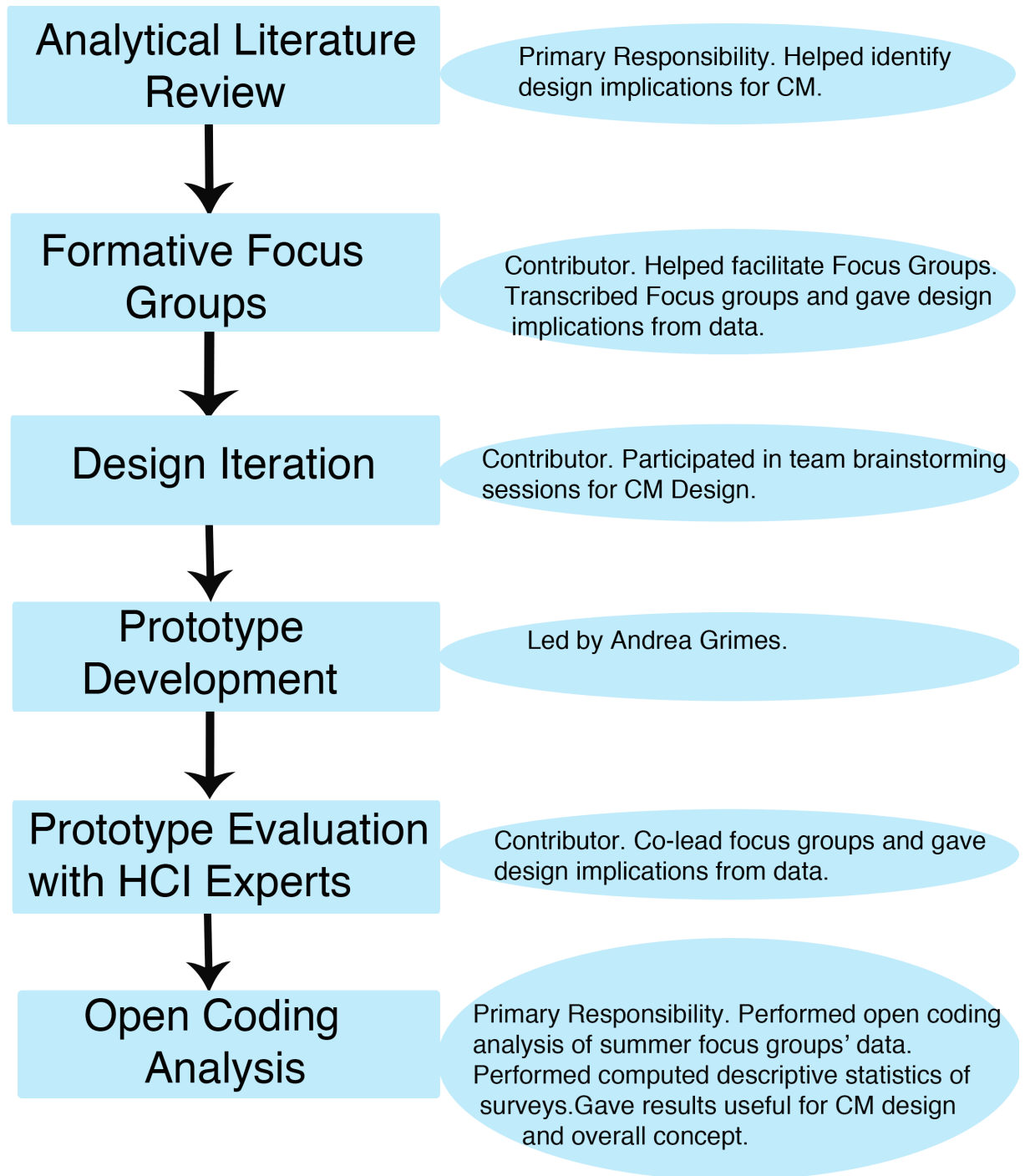
#### **Overview**

Based on the design implications that my mentor, Andrea Grimes, derived as a result of the EatWell project, she designed the initial Community Mosaic concept. After this concept had been developed, I began working with her to identify ways in which this design could be improved and better tailored for our target population. I engaged in multiple months of research, which I will describe in the remainder of this section. An overview of my role in this research can be found in Figure 3.

I started off my research by doing an analytical literature review of technologies for health in a social context, health in the African American Community, people's perceptions about health in their community, and comparing the perceptions of single moms to other demographic groups. This helped me identify related work within HCI. Through this analytical literature review, I helped to identify design implications for the development of Community Mosaic.

In order to get design inspirations and test the usability of the CM, I with my mentor Andrea Grimes helped design and conduct two user studies in the form of focus groups. The first user study, based on interpreting design implications, was conducted by recruiting participants at a YMCA branch in an urban, low-income community in southwest Atlanta, GA. The YMCA is a non-profit organization that provides a number of services to local communities including exercise facilities and health-promotion

# COMMUNITY MOSAIC PROJECT



**Figure 3: Overview of my role in the Community Mosaic Project**

programs [2]. The second user study tested the usability of the CM and was conducted by recruiting participants within the HCI community at Georgia Tech, Atlanta, GA.

I performed an inductive analysis [12] of the data from the focus groups by transcribing the audio recordings. In addition, I input the survey data from the formative study into Excel to derive descriptive statistics. I used open coding analysis method for understanding the transcripts. I had brainstorming sessions with Andrea for discussing analysis results that I came up with. This helped me reach conclusions about design implications for the Community Mosaic as well as have an in depth understanding of what people considered barriers and resources towards eating healthfully in their community. In addition, my analysis helped me learn what people felt were productive and unproductive ways of the community working together to encourage healthy eating in the community.

## **User Studies**

### ***User Study 1: YMCA Focus Groups***

The YMCA served as a good location, as it was more likely to attract people with a desire for being healthy. Moreover, since the YMCA is a neighborhood-oriented organization, it helps to obtain participants who had a common geographic frame of reference, specifically the low-income African American community in south west Atlanta. In this study, we recruited African Americans to participate in focus groups in which we obtained their feedback on our system design. This would help in sticking to

my original research question of figuring out people's perceptions of health within their community.

*Participant Overview:* We conducted a total of seven focus groups and the total number of participants used was thirty one. Each subject participated in one focus group. We conducted multiple focus groups, of 5-7 people each. Each focus group lasted approximately 60 minutes. Thus, the time commitment for each participant in this study was approximately 60 minutes.

Here is a summary of what occurred in each study session:

1. Demographic survey: Participants completed a survey in which I obtained basic demographic information like gender, age group, marital status, eating habits, and technology use.
2. System design feedback: During the focus groups, I had participants complete simple exercises in which I asked them what strategies were important in trying to be healthy. I showed them a set of cards, each with a different potential feature. I then asked them to select three of the features they think are most important and three that are least important. I compared the card choices people expressed in the focus groups and extracted the reasons why people made those choices to look for trends for the design of the CM technology.

Here is the list of card options they were given:

1. Surfacing Community Issues: Discuss the ways in which it is difficult to eat healthfully in the community
2. Community Advocacy: Help people advocate for healthier food options in the community (e.g. at grocery stores and restaurants)

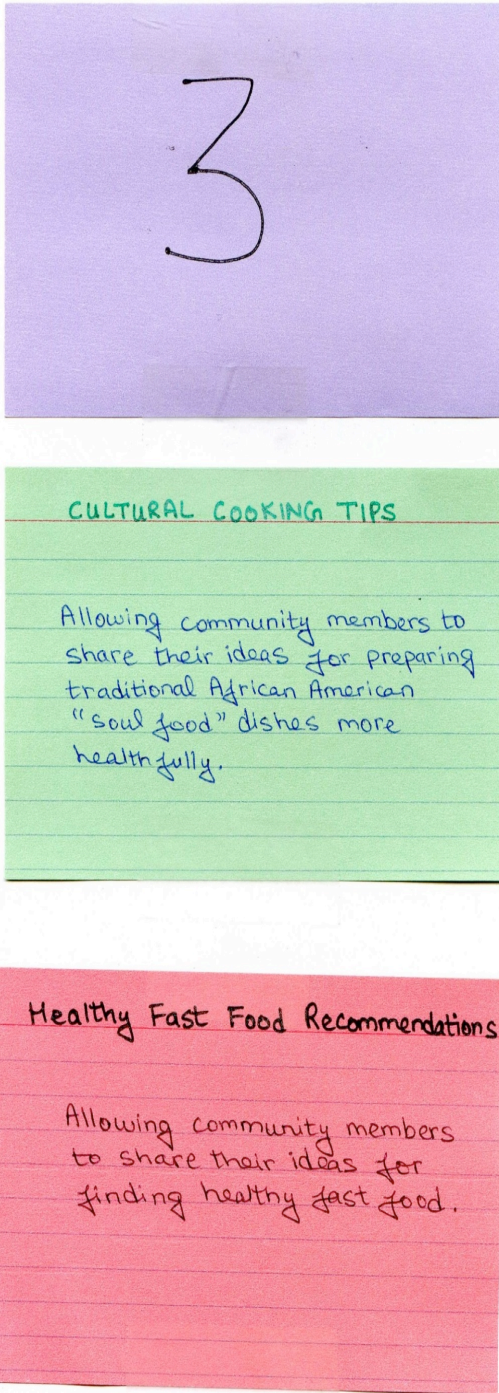
3. Showcase Community Resources: Discussing the things in the community that can help people eat more healthfully (e.g. sources for inexpensive, quality vegetables)
4. Showing How Healthy the Community is: Helping people to see how healthy or unhealthy the community is as a whole (with respect to eating habits)
5. Community Encouragement: Putting community members in touch so that they can encourage one another through their personal nutrition-related challenges
6. Community Praise: Allowing community members to see the success stories of people who are now eating more healthfully and give them praise



**Figure 4. Some of the participants during the card choosing exercise in a focus group in YMCA**



7. Community Feedback: Helping community members get feedback from one another on the healthiness of their eating habit
8. Awareness: Showing why eating healthfully is important (e.g. increased awareness of diet-related diseases)
9. Cultural Cooking Tips: Allowing community members to share their ideas for preparing traditional African American “soul food” dishes more healthfully
10. Exposure to New Healthy Recipes: Allowing community members to share their ideas for preparing healthy dishes in a variety of cuisines (e.g. Italian food, Chinese food, African American food, etc.)
11. Healthy Fast Food Recommendations: Allowing community members to share their ideas for finding healthy fast food
12. Alternates for cheaper and healthier groceries: Allowing community members to share what items they feel work for them both health and cost wise.
13. Peer Nutrition Advice: Allowing community members to share their general nutrition tips



**Figure 5: Some examples of what the card options looked like**

## ***User Study 2: Georgia Tech Focus Groups***

In this study, I recruited members of the HCI community in Georgia Tech to participate in focus groups in which I obtained their feedback on the system design. Since all participants were HCI Experts, I used heuristic evaluations and think-aloud methods for evaluating the usability of the system. Heuristic evaluation involves recruiting evaluators to critique an interface (usually represented with pictures and a textual description). Evaluators look for problems in an interface's compliance with heuristics that encode important usability guidelines [8]. I used the following heuristics to evaluate the system [11]:

1. Consistency and standards: Users should not have to wonder whether different words, situations, or actions mean the same thing; follow platform conventions.

*Sample Question asked:* Did you feel any desire to share how you were feeling? Why/why not? If YES, what kinds of emotion did you want to express?

2. Flexibility and efficiency of use (novice vs. expert users) : Accelerators, unseen by the novice user, may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users; allow users to tailor frequent actions.

*Sample Question asked:* Would you have preferred to enter the emotion tag in your original message?

3. Visibility of system status: The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

*Sample Question asked:* How confident did you feel that your content was received? What made you feel confident or unsure?

4. Help and documentation: Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation.

*Sample Question asked:* Did you ever feel like you needed help from the system?

If so, did you feel like you were able to get the appropriate help?

5. Help users recognize, diagnose, and recover from errors: Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

*Sample Question asked:* Did you ever have any problems that you did not know how to diagnose the cause of or recover from?

6. Match between system/real world: The system should speak the user's language, with words, phrases and concepts familiar to the user, rather than system-oriented terms.

*Sample Question asked:* What are your thoughts about the Commit button? Do you see yourself ever pressing it? Why/why not?

7. Aesthetic and minimalist design: Dialogues should not contain information that is irrelevant or rarely needed.

*Sample Question asked:* Anything in the detail window that is unnecessary?

I chose heuristic evaluation as one of the techniques because of its informal nature and low cost, as found in a survey of usability practitioners [9]. Furthermore, think-aloud testing in which naive subjects comment on the system as they use it, was selected as another method because it helps to understand the thinking process of the user so as to find any problems that the user or designer might not think of themselves.

Here is a summary of what occurred in each study session:

Session 1: I met with participants, gave them a survey to fill out, and explained the study to them. I then asked them to send MMS (pictures + text captions) of ways they are trying to eat healthfully and send them to CM over about 5-7 days (approx duration=10 minutes)

Session 2: Focus group in which participants came back and evaluated the system (which will display the content that they have shared) (approx duration=90 minutes)

Each subject participated in one focus group. We conducted two focus groups of approximately 3 people each. Each focus group lasted approximately 100 minutes. Thus, the time commitment for each participant in this study was approximately 100 minutes.

### **Analysis**

I studied grounded theory [7] and used it to start analyzing the transcribed data from the focus groups conducted in the summer of 2009. This helped to examine the reasoning behind why people made their respective card choices. Using information from the transcripts and surveys, I analyzed the different card choices of single moms, married moms, and men from the focus groups. I tried to find different comparisons and patterns to understand any correlations between choices made by different people using the technique of computed descriptive statistics.

The participants fall into eight categories as shown in the table below:

Categories	Number of People
Single Mother	11
Married Mother	6
Single Female	5
Married Female w/o kids	1
Single Father	1
Married Father	3
Single Male	2
Married Male w/o Kids	2

**Table 1: Different Categories of the participants**

In addition, I grouped the categories described above into new categories as shown in the table below. This helped me to understand the choices people expressed towards trying to eat healthfully and their perceptions of their community by keeping their demographic background in mind.

Overview	Number of People
Total Number	31
Total Women	23
Total Men	8
Total Single	19
Total Married	12
Total with Kids	21

**Table 2: Overall summary of the participant sub groups**

It will be important to note that I analyzed a subset of the focus groups. Out of the seven focus groups conducted in total, I analyzed the first four focus groups. My analysis

included 19/31 participants out of which there were 8 single mothers, 4 married mothers, 3 single females, 1 single male, 3 married fathers, 1 married male with no kids, 1 single father, and 1 married female with no kids.

Next, I went into the depth of the focus groups transcripts to see why people chose what they did and to understand people's perceptions of their community with respect to making healthy food choices. I used open coding analysis method for understanding the transcripts. Open coding is the process of breaking down, examining, comparing, conceptualizing and categorizing data. I chose this method because it encourages specification and dimensionalization for pattern recognitions [1]. I started off by coding statements in the transcripts and then grouping similar codes into higher level categories.

I came up with a total of eighteen categories: SHARING, MOTIVATION, SHOW, UNAWARE, COOKING, SUBSTITUTE, CHOICES, ACCOUNTABILITY, STOP TALKING, PEOPLE ALREADY KNOW, EATING UNHEALTHY, EATING HEALTHY, BUDGET, FAST FOOD, NEGATIVE APPROACH, NOT AS USEFUL, MOVE FORWARD, and SOURCES. Below is an example of the STOP TALKING category and the codes that it represents:

STOP TALKING	STOP MAKING EXCUSES
STOP TALKING	ALL TALK, NO CHANGE
STOP TALKING	ALL TALK, NO CHANGE
STOP TALKING	BRING ISSUES UP REPITITIVELY
STOP TALKING	BRING ISSUES UP REPITITIVELY
STOP TALKING	NOT IGNORANT
STOP TALKING	NOT ALARMED
STOP TALKING	DON'T CARE
STOP TALKING	NOT GOING TO EAT THAT
STOP TALKING	DON'T TELL ME WHAT TO EAT
STOP TALKING	NO ONE WANTS TO HEAR IT
STOP TALKING	NOT EXCITING
STOP TALKING	ALL TALK, NO CHANGE

**Table 3: Example of a category and the codes it represents**

This open coding analysis helped me reach conclusions about design implications for Community Mosaic as well as have an in depth understanding of what people considered barriers towards eating healthfully in their community.



## **CHAPTER FIVE**

### **RESULTS**

In this section, I will present trends I observed while analyzing the YMCA focus groups' card activity and surveys for refining the design of the CM. More importantly, the results will be helpful for understanding the barriers towards eating healthfully along with the resources that actually work as felt by the low-income African American community of south west Atlanta.

My results show that the single and married as well as men and women have different opinions of eating lifestyles. Further on it was found that by showcasing all the available choices in eating healthy, people will feel motivated to take personal accountability of making a change in eating habits. In the following sections I will discuss the overview of card-activity analysis and the overall themes that emerged during my open coding analysis.

#### **Overview of Card Activity Analysis**

This section will show the kind of card choices people made with respect to their gender, marital status and number of children.

The table below shows the most liked, least liked, and total number of times a card was selected:

CARD CHOICES	TOTAL CHOSEN	MOST LIKED	LEAST LIKED
1. Surfacing Community Issues	15	1	14
2. Community Advocacy	14	8	6
3. Showcase Community Resources	14	11	3
4. Showing How Healthy the Community is	19	4	15
5. Community Encouragement	17	5	12
6. Community Praise	17	5	12
7. Community Feedback	10	1	9
8. Awareness	22	14	8
9. Cultural Cooking Tips	16	15	1
10. Exposure to New Healthy Recipes	13	10	3
11. Healthy Fast Food Recommendations	17	10	7
12. Alternates for cheaper and healthier groceries	12	7	5
13. Peer Nutrition Advice	9	1	8

**Table 4: Number of participants who chose a particular card**

The most talked about card choice was “Awareness” (22/31) and the least talked about choice was “Peer Nutrition Advice” (9/31). Moreover, the most liked card choice was “Cultural Cooking tips” (15/31) and the least liked card choice was “Showing How Healthy the Community is” (15/31). As you will see when I discuss the themes in more detail, awareness of health problems was discouraged whereas the awareness of healthful resources was encouraged. “Cultural cooking tips” was major hit especially among the single women all of whom (11 in total) cook at home as shown in the surveys.

I also looked at the card choices by observing what kind of cards different categories like single mothers, married males, etc., picked to further understand the

reasoning behind their card choices. It was found that the females and married people most liked “cultural cooking tips.”

Females most frequently chose “cultural cooking tips” as a method they thought was most likely to be helpful. On the contrary, males chose “healthy fast food recommendations.” This was consistent from the data in the surveys where 2/8 men said that they cook at home while 21/23 women claimed to cook at home that indicated women’s preference of “cultural cooking tips” over men’s preference of “healthy fast food recommendations.” Moreover, 4/8 men found “healthy fast food recommendations” as most useful compared to 6/23 for women. It was also noted that 6/8 men were against “community encouragement” while 2/23 women opposed to the same.

The singles and people without kids least liked “showing how healthy the community is” whereas the married and people with kids least liked “surfacing community issues.” The females least liked both “showing how healthy the community is” and “surfacing community issues.”

Lastly, the married and the singles categories had quite an opposing stand on card choices. 9/19 singles most liked “showcasing community resources” as compared to the married 2/12. Also, 7/19 singles were against “community advocacy” while only 1/12 of the married was against it. Thus, we see a difference of outlook in health lifestyle of the singles and the married in this community. Now, I will further examine why people chose the cards through the results of my grounded theory analysis of participants’ answers to the focus group questions.

## Themes that emerged

After analyzing all the codes, I grouped them into categories such as “stop talking”, “showing”, “choices”, “accountability”, etc., and finally grouped the categories together to form different themes. After which, I found correlations among different themes to understand the overall idea gauged from the card activity analysis which will in turn answer my research questions.

The four themes that I interpreted from the different set of categories are *A stop to talking and a start to doing* (“Stop Talking”, “People already know”, “Negative Approach”, “Not as useful”), *Seeing is believing* (“Sharing”, “Show”, “Sources”, “Move Forward”), *Awareness of eating healthier by making better choices* (“Unaware”, “Eating Healthy”, “Substitute”, “Eating Unhealthy”, “Fast Food”, “Cooking”, “Budget”), and *The more choices there are, the better the health in the community is* (“Choices”, “Accountability”, “Motivation”).

The overall idea from all these themes is that the participants felt that people are already aware of all the challenges faced in their community and therefore no more time should be allocated on talking about the negative issues. However, participants expressed interest in getting aware of how to eat healthfully with a price constraint by using better cooking techniques, healthier fast food options, and correct portion sizes. The participants felt that by actual showing of such resources can help the community in moving forward through motivation and personal accountability for a change in the overall health of the community.

In the following paragraphs I have described what each theme means by giving details about the codes associated with it. Moreover, I have also shown how all the themes relate

with one another to get the overall idea of what the choices made by the participants meant.

### ***A stop to talking and a start to doing***

Categories used: “Stop Talking”, “People already know”, “Negative Approach”, “Not as useful”

There was a general consensus among my participants that people already know of the challenges faced towards health and healthy eating in their community. However, they feel that nothing has been done about it. When asked to describe why “surfacing community issues” was a less liked card choice, P7 explained that we are, “*Talking about the problem,[and] never [changing] the problem.*” Furthermore, when it came to “community feedback”, P11 expressed that, “*We could talk all we want all day long but until we come together and do something, that defeats the purpose.*” Participants felt people are aware of the challenges, and that it was therefore critical to move forward and take action.

These are the following four categories that made me reach the theme of *a stop to talking and a start to doing*:

STOP TALKING: This category got most responses from card choices – “Peer Nutrition Advice” and “Showing How Healthy the Community is.” Since all of the opinions expressed under this category are negative, this is an overall negative category. Thirteen out of the thirty one participants felt that the same issues should not be brought up repetitively. P9 voiced the same saying, “*We know what the issues are, why bring them up over and over again?*” Another tag that was formed with what the participants said

was- “All talk no change”. This means that “surfacing community issues” only is not enough. According to P17, *“This is only helpful if then you give me a solution. But just telling why it is difficult to eat healthy is not helping.”* Overall, this category showed how people are not ignorant, already know of the issues and do not want to hear about it anymore.

PEOPLE ALREADY KNOW: This category got most responses from the “Awareness” and “Showing How Healthy the Community is” card choices. Again, the opinions voiced for this category are all negative and hence this is a negative category. Participants mostly expressed how everyone is aware of how important it is to eat healthfully. P18 expressed the same, *“People know why it’s important to eat healthfully.”* However, another participant expressed concern over how people know what to do yet they still don’t abide to them. For example P11 said, *“I pretty much feel that everyone knows certain things are bad for them but yet we still do them.”* Therefore, there is a need to understand why people still do what is bad for them even when they know of it.

NEGATIVE APPROACH: This category got most responses from “surfacing community issues” and as the category says it, this category got all negative responses. Participants generally did not like the idea of talking about the negative things in their community. For example, P14 chose “surfacing community issues” as a least liked card giving the reason, *“Because you are more focusing on the negativity rather than the positive aspect of it.”*

NOT AS USEFUL: Some participants found the cards “Showing How Healthy the Community is” and “Community Feedback” less significant to the other more useful card choices. For example, P12 said community feedback is not, *“as useful.”* Instead, P12

found sharing more useful and liked card choices like “cultural cooking tips” and “healthy fast food recommendations.”

Therefore, the above four categories help to convey that a stop to talking needs to occur. Instead, “showing” of helpful resources and relevant actions taken needs to happen.

### ***Seeing is believing***

Categories used: “Sharing”, “Show”, “Sources”, “Move Forward”

During the focus groups a lot of participants used words like sharing, showing and stop talking. This implies that it is much more useful to show helpful solutions for challenges faced in the community. For example, most males preferred the “healthy fast food recommendations” card. Thus, it will be helpful to share tips about less unhealthy fast food choices. P12 made such a suggestion:

*“At McDonald's – I mean you can get the salad and salad dressing, dip your fork in salad dressing and then you know, then eat salad that way. You share tips like that, that might help”*

According to P12, it matters how you talk and thus share useful information in your community. P18 expressed a similar opinion for showcasing community resources, *“I mean sometimes you just put it out there; but you know different creative ways to put it out there.”* Therefore, participants felt that people in the same community need to move forward from just talking to using something like the CM, where people talk with texts and show pictures of helpful resources by sending it to the CM public display.

These are the following four categories that made me reach the theme of *seeing is believing*:

SHARING: This category got responses from the cards that were most liked and thus is an overall positive code. The Sharing category means that people should share why they feel it is difficult to eat healthfully so as to find common solutions as one community.

“Cultural cooking tips” was the most liked card choice with fifteen out of thirty one participants choosing it. Therefore, we see how traditional soul food holds an important spot in the low-income African American community. According to Kittler and Sucher, soul food includes fried food, sweet potatoes, corn, and green leafy vegetables [13]. They also suggest that people are most resistive to changing traditional food habits. P2 expressed an opinion about the “cultural cooking tips” card by saying, “*So many black people their taste buds are in love with certain taste of food.*” Thus, it is pertinent to share similar problems faced in a community along with the solutions.

SHOW: This category got responses from the cards – “cultural cooking tips” and “awareness.” SHOW suggests that people have more faith when they see something useful rather than just hearing about it. This is consistent with the fact that people learn better and quicker with visuals [14]. For example, P10 signified the importance of visuals by referring to the “awareness” card by encouraging to, “*Show pictures that would have an impact.*” The visuals shown on the CM display would help in such a case by showing pictures of people’s successful eating strategies. P4 expressed another opinion about showing/sharing versus talking by pressing on the importance of, “*Sharing recipes as opposed to telling somebody what to do.*” According to P4, nobody likes to be told what



to do and hence the best way to encourage people to make a change would be by actually showing them how a particular dish can do wonders for both good taste and health.

SOURCES: This category refers to the source of information one gets within a community. Knowing the members in your community will help in establishing faith as one can relate to the suggestions and solutions offered on health issues. For example, P12 thinks “*source of information*” matters when trying to get peer nutrition advice since one just cannot take advice from people who one does not know well. Therefore, CM might help in attaining that sense of trust in sources where people share information within the same community.

MOVE FORWARD: This category relates back to the negative approach where the participants feel that everyone should stop complaining and move forward from talking to doing something about it. P12 feels we should not encourage surfacing community issues as that is, “*Just complaining instead, of you know, moving forward.*”

Therefore, we see how it is important to share your knowledge in a way that helps members in the community actually see what is useful and what is not instead of just hearing about it. This is a step away from just talking about the barriers towards eating healthfully and a step towards using the resources that are available for a healthy living. Showing and sharing leads to choices that can help motivate people to take personal accountability.

### ***Awareness of eating healthier by making better choices***

Categories used: “Unaware”, “Eating Healthy”, “Substitute”, “Eating Unhealthy”, “Fast Food”, “Cooking”, “Budget”

I observed from the focus groups transcripts that participants felt that people are unaware of how they eat unhealthy and do not know about the correct serving portions. Moreover, the people want to know of better cooking ways as well as how to eat healthfully on a budget. If people can distinguish between eating healthy and eating unhealthy, they can substitute for better options that include consuming less fast food, cooking, and eating healthy on a budget.

These are the following seven categories that made me reach the theme of *awareness of eating healthier by making better choices*:

UNAWARE: The majority of the participants felt that people knew about health disparities in their community but would like to know more about healthy ways to cook at home, eat fast food, and take appropriate portions while eating. P9 chose “showcasing community resources” as one of the most liked cards as according to P9, *“Sometimes people are just not aware of them.”*

EATING HEALTHY: This category got most responses from the “community advocacy” card choice. It appeared that people want to advocate for healthy food items in shops. In addition, they want more such choices nearby in place of abundant fast food restaurants. P16 expressed a concern about too many fast food joints nearby, *“There’s no reason why there’s 6 fast food restaurants in walking distance.”* P13 addressed the need for community advocacy by saying, *“We do have a health food shop in the community but there’s really not food in there.”* Moreover, P16 emphasized on the importance of alternates for cheaper and healthier groceries, *“Eating healthy is not as fancy as when you know there’s Whole Foods down the street or fresh market or farmer’s market,*

*somewhere!*” Thus, availability of a number of healthy grocery options in close proximity would encourage being healthy in a community.

EATING UNHEALTHY: P16 also expressed how people “*don't know how to eat.*” while talking about “awareness” and its importance. If people are informed about correct portion sizes and number of calories in different food items they consume, it will help in eating less unhealthy.

SUBSTITUTE: One of the participants' most liked cards was “alternates for cheaper and healthier groceries” as that gave the opportunity to substitute among choices to best suit one's budget. P3 most liked “exposure to new healthy recipes” as it provides choices to, “*Substitute [for something] that tastes really good.*”

FAST FOOD: P8 confessed to choosing, “*Fries over apple slices.*” It is pertinent to limit eating fast food as much as possible. P13 suggested, “*So if you know people are gonna eat fast food, they just need to make good decisions when they do it.*” Hence, if people eat in moderation and know the right portion sizes they can avoid some damage done by eating fast food.

COOKING: This category got responses from the cards “exposure to new healthy resources” and “cultural cooking tips.” Since, all the comments under this category are positive, it is an overall positive category. Given that mostly this community likes sticking to traditional foods, we need to expose cooking ways that are better and healthier. P15 most liked “cultural cooking tips” with the explanation that, “*Soul food dishes and if those are the things that we like, enjoy eating, then if we can make it healthfully then that will be really good.*” P15 also encouraged “exposure to new healthy recipes” by giving an example, “*Like, I found some food recipes on the foodnetwork.com*

*that are low calorie and taste wonderful.*” Thus, cooking in ways that not only result in fewer calories but also taste delicious would encourage healthy eating.

BUDGET: Lastly, since my research was on the low-income African American community, it becomes important to consider price constraints while trying to eat healthfully. P13 suggested, *“A brochure or something to that effect on how you can eat healthy and stay within your budget”* while talking about “alternates for cheaper and healthier groceries.”

Thus, people can eat healthfully in this community if they are able to buy healthy food items at a reasonable cost in nearby stores and cook using healthy recipes at home. Moreover, if people are aware of the correct portion sizes and the number of calories their food intake can result in, the much craved fast food consumption will have less harmful effects.

***The more choices there are, the better the health in the community is***

Categories used: “Choices”, “Accountability”, “Motivation”

This theme is trying to explain that by motivating people to use the available choices encourages personal accountability and hence change. A lot of the participants felt that they did not have enough good quality stores and restaurants with healthy eating options in the neighborhood. P17 suggested that through community advocacy, *“You can get more healthy food options in the community, if they were available I think by default people would just eat more of them.”* On the same note P6 suggested that more is better: *“Surround the people with choices so that they can make better choices.”*

Below are the three categories that I used to reach the theme of *the more choices there are, the better the health in the community is*:

CHOICES: This category refers to showing of existing options and advocating for the options that the community wants. Thus, by making people aware of the different kinds of cuisines easily available will encourage not sticking to the same kind of food. P11 makes a good point by saying that, *“Mental variety that keeps me going and If I knew other dishes other than soul food and a few Italian dishes, then it would limit you know my restaurant visits.”* P6 advocated for “healthier fast food options”, *“People are gonna eat fast food no matter what. Why not give them healthier options.”* Thus, ultimately it leads to your own personal choice and picking options from the pool of easily available ones.

MOTIVATION: This category got responses from card choices like “community praise”, “community encouragement”, “community advocacy”, and “community feedback.” Therefore, this category had a major emphasis on community. Participants mainly spoke about motivation as a way of community encouragement, where they felt it can *“bring each other together”* by promoting the feeling of *“you can do it too.”*

ACCOUNTABILITY: This category mostly had the tag of “hold you accountable.” This refers to taking personal responsibility of making positive changes through encouragement from others. Accountability can result from providing available choices and motivating others to use such easily accessible opportunities for eating healthfully.

While talking about the effectiveness of “community encouragement” P11 said, *“Positive reinforcement, when you have someone working with you towards a certain goal, it makes it easier...because now you are being held accountable.”* Moreover, P17

spoke about how “community praise” can help people get inspired to eat well – *“Now I do have to accept personal responsibility for the fact that I’m not you know doing these things because it can be done and here’s a real live example of it.”* Thus, we can see how success stories displayed on the CM display might help to inspire others in the community to do the same. Once someone takes responsibility, it triggers taking action and being persistent about making a change.

Therefore, we see how a stop to talking and a start to doing can help in showing people the better health choices in their community, which will make them believe that it is possible through motivation and self accountability to make a positive change towards health in their community.

## **CHAPTER SIX**

### **DISCUSSION**

My results highlight a number of themes pertaining to finding ways for eating more healthily due to the correct understanding of the barriers as well as resources. Based on these findings, I present suggestions for future work in this area. In particular, showing off community resources, choice of making the better eating choice, how different lifestyles result in different eating habits, and design implications for the CM.

#### **Showing off community resources**

My results indicated that people wanted to see the resources available in the community rather than hearing about what the community lacks. The participants felt that seeing helpful eating strategies used in the community had a bigger impact on them. Thus, future research should examine how visuals of easily available health resources affect motivation related to eating habits. Once the CM has been deployed in the YMCA for our target audience, a content analysis along with the effectiveness of the technology used should be determined.

Some participants said they were sick of listening to how bad the health condition in the US is and that they wanted action instead of just talking. Some said that their eyes opened up when someone close to them got really sick because of eating unhealthy. Another participant had mentioned during the focus group that people sometimes indulge in bad eating habits as a way to get away from emotional, physical, or mental stress. Therefore, future research should be conducted to investigate whether stress could be a big factor towards not eating right.

It was also pointed out by members of the community that there were limited resources for eating healthfully in the south west Atlanta area. Steps should be taken by the community as well as the US healthcare department to address such deprivation. Moreover, future research should be done to determine the availability of resources in other communities across the US.

### **Choice of making the better eating choice**

My results showed that by showcasing all the available choices in eating healthy, people may feel motivated to take personal accountability of making a change in eating habits. In addition to the content analysis of the materials sent to the CM, I think similar studies should be done in different communities to see if numerous healthy eating choices actually have a reverse effect from eating unhealthily.

One of the most important factors mentioned for not eating healthfully was cost. A lot of people thought that one gets good food only at a certain price. However, one of the participants mentioned that you give people with shops of food, drinks, and smokes; and they will indulge in everything, because so is the life of an average hardworking American to spend money on small leisure. So another question that arises is if cost really is the reason for not eating healthfully. Once, the cost friendly choices for eating healthfully are highlighted to the YMCA participants, it will be interesting to examine how many people adapted to those choices instead of sticking to their old unhealthy eating habits.



### **Different lifestyles result in different eating habits**

My results show that the single and married participants in the study had different opinions of healthy eating strategies just like men and women did. This past summer I was exposed to the personal eating habits of the people from the YMCA in south west Atlanta. A lot of these people felt that they were not eating right at all despite the fact that most of them exercised in the YMCA. As observed from the survey, thirteen out of thirty one people were not satisfied with their eating habits. One question that arises is, if these people are motivated enough to exercise, then why would they not try to eat healthfully? Looking at the focus groups data, I saw that majority of the people did not have time to actually go get groceries and cook a healthy meal. One of the participants from the focus group P11 said that it is, *“Not limited to community; fast paced society dictates what you eat because of time”*, when questioned about unhealthy eating practices within the community.

The average American leads a very busy life with long work hours that leaves little or no time for personal leisure activities, family time, and of course time spent on house chores like cooking, cleaning, etc. Similar were the feelings of the bachelor men in the focus groups, who did not buy groceries and just ate out as it was way more convenient as you do not have to worry about getting groceries and cleaning dishes.

### **Design Implications for the CM**

Building upon my study results, I will now discuss design guidelines for the CM. These design implications were based on the feedback I got from the participants during

the focus groups conducted with the YMCA group in south west Atlanta and the HCI group in Georgia Tech.

***Possible Design Implications from Focus groups conducted with YMCA community***

Many people thought it was important to share ideas for preparing cultural foods more healthfully, as well as other types of dishes (e.g. Italian, Chinese, etc.). Therefore, CM should have a distinction for different cuisines that have healthy eating tips. Different buildings for different categories on the CM display screen would be a great idea to make the content more organized.

***Possible design implications from focus groups conducted with HCI Group***

These people felt that once the message goes out of the outbox it should be sent. I think that the user should rate and describe the picture together without having to worry about getting a confirmation message back that asks for a rating. In order to make sure that people remember to use the CM regularly, a shortcut option to have on the home screen of the phone would be beneficial. It can be useful to allow multiple pictures on one window to get a better idea of how the content looks like.

Since motivation results in personal accountability as gauged from the participants, another possibility could be to send out texts to the people contributing by telling them how many people have committed and viewed their strategy in order to make them feel that their contribution matters. Another feasible option would be to allow people to email pictures instead of texting, since it might be cheaper and quicker. A participant had expressed how having a printer next to the CM would be helpful as people could print recipes as *“tangible take homes are great!”*

## **CHAPTER SEVEN**

### **CONCLUSION**

The results of my research showed that the Community Mosaic can be a valuable system to show people cost friendly and easily available healthy eating resources in their community. Since my results showed that more choices can result in a change of the eating lifestyle of individuals, future studies should be done to confirm such an interpretation. Moreover, I encourage future research in studying how different lifestyles result in different eating habits, which will help in determining the effect of lifestyles on staying healthy. Finally, the concept of sharing healthy eating strategies in a local community using technology may prove to be applicable in areas of health beyond nutrition, such as encouraging physical fitness and support groups for chronic illnesses.

## APPENDIX A

### Single Mothers (11 in total) Survey Analysis

The following is a sample of the responses of the single mothers from the survey given out during the focus groups conducted in the YMCA.

PID	# of Children	Age Group	Satisfied with eating habits	Why?
P19	2	38-45	Yes	-
P11	2	38-45	No	Tend to eat on the run + eating in the run sometimes lead to bad choices
P22	2	38-45	Yes	Because I believe that I eat healthy foods
P1	3	38-45	Yes	-
P2	1	46-54	No	Do not eat as healthy as I want
P3	1	55-60	No	-
P5	2	31-37	No	I want to cook at home
P8	1	31-37	Yes	Because although there can be improved, they are generally healthiest then most
P30	2	46-54	No	Not always but I do keep quality + healthiness of food top priority
P31	2	38-45	No	I can eat less snacks
P18	1	38-45	No	Need more fruits/vegetables servings, less meat

## APPENDIX B

### Different Categories Card Choices

The following are the most important and least important card choices of participants from the design activity conducted in the focus groups in the YMCA.

PID	Category	Most Imp	Least Imp
P1	Single Mother	3,4,8	1,10,11
P2	Single Mother	10,9,3	4,6,7
P3	Single Mother	10,8,12	6,7,13
P5	Single Mother	5,9,8	13,1,12
P8	Single Mother	1,9,5	11,13,4
P11	Single Mother	2,5,10	7,8,4
P18	Single Mother	10,3,12	4,7,8
P19	Single Mother	2,3,11	8,9,10
P22	Single Mother	3,2,8	6,5,7
P30	Single Mother	3,8,10	1,2,12
P31	Single Mother	8,9,11	2,7,13
P4	Married Mother	9,4,6	1,2,3
P12	Married Mother	8,9,11	7,1,13
P13	Married Mother	12,11,10	2,1,8
P14	Married Mother	6,3,8	1,11,5
P23	Married Mother	9,11,12	13,8,4
P29	Married Mother	8,9,10	3,12,13
P6	Single F w/o Kids	2,5,11	8,4,1
P9	Single F w/o Kids	9,8,3	1,4,2
P17	Single F w/o Kids	2,3,6	1,4,8
P26	Single F w/o Kids	2,3,9	4,6,11
P27	Single F w/o Kids	6,9,10	4,8,11
P15	Married F w/o Kids	9,10,11	1,4,8
P7	Single M w/o Kids	2,9,11	1,4,5
P24	Single M w/o Kids	13,11,8	6,12,5
P20	Married Father	12,9,4	13,6,11
P25	Married Father	8,10,2	7,5,1
P28	Married Father	8,9,11	4,5,10
P16	Married M w/o Kids	11,12,8	2,3,5
P21	Married M w/o Kids	3,6,5	8,13,11
P10	Single Father	4,7,8	5,1,10

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